Wavelink Avalanche Mobility Center
Linux Reference Guide

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Chapter 1: Installation

You can install and manage many of the components of Avalanche MC on a Linux operating system. This includes the Enterprise Server, Stats Server, Mobile Device Server, License Server, Service Manager, InfoRail service, and the associated Tomcat Server for the Web Console. These components can be installed from RPMs or from tar files.

NOTE The Avalanche MC Console and any Infrastructure Servers must be installed on a Windows operating system. Refer to the *Avalanche 5.0 System Requirements* paper on the Wavelink Web site for details on system requirements.

Wavelink recommends installing the following files at the Enterprise Server location: Enterprise Server, License Server, Statistics Server, InfoRail service, and the Tomcat WAR files.

Wavelink also recommends installing the Mobile Device Server and Service Manager together.

This chapter provides instructions about the following information:

- Installation Prerequisites
- Overview of Installation Steps
- Installing with RPM Files
- Installing with tar Files
- Setting Up Tomcat
- Increasing the Open Files Limit

NOTE In Avalanche 5.0, all licensing is done through the Java Console.

Installation Prerequisites

The following minimum specifications are required before you install the servers on Linux:

- Java Run-Time Environment (JRE) 1.6 update 20
- Sufficient rights to install programs and create and maintain the Avalanche MC Server working directory
- Sufficient rights to access USB and serial ports
- The Linux user account that is running the servers must be a member of the **tty** and **uucp** groups for USB and serial support
- Sufficiently high limit on open files. Refer to *Increasing the Open Files Limit* on page 11 for information about allowing more files to be open.

You should also have the following installed at the location you plan to install the Enterprise server:

- Tomcat 6.0.24
- Installed database (PostgreSQL 8.4.2 or Oracle 11g)

NOTE If you are using Oracle 11g, you must also have an Administrator installation of the Oracle Client Utility on the same computer as the Avalanche Java Console.

For system requirements, see the *Avalanche MC 5.0 Linux System Requirements* paper on the Wavelink Web site.

Overview of Installation Steps

Perform the following steps, in order, to ensure the servers are correctly installed on a Linux operating system:

1. Verify that installation requirements are met and that the database, JRE, and Tomcat are installed.

2 Obtain the RPM or tar files for the Enterprise Server, Statistics Server, Mobile Device Server, Service Manager, License Server, and InfoRail service. To obtain these files, contact Wavelink Customer Service. If you want to use the Web Console, you will also need a WAR file from Wavelink.

3 If you are using RPM files, use your package manager to install.

   -Or-

   If you are using tar files, create directories for the tar files, and then extract the files to the proper directories.

4 Set user permissions to allow the Linux user to execute commands for each server.

5 Initialize the databases and import the WAR file.

6 Run the servers.

Installing with RPM Files

The preferred method of installing Avalanche services uses RPM files. When you install using an RPM, it creates the directories for the files and adds the services to the Service Manager.

Wavelink recommends installing the following files at the Enterprise Server location: Enterprise Server, License Server, Statistics Server, InfoRail service, and the Tomcat WAR files.

Wavelink also recommends installing the Mobile Device Server and Service Manager together.

To install using RPM files:

1 Obtain the RPM files from Wavelink Customer Service.

2 From a shell, type:

```
rpm -i [filename].rpm
```

   where [filename] is the name of the RPM file you want to install. Repeat this task for all the RPM files you want to install locally.

Installing with tar Files

As an alternative to RPM files, you have the option to install Avalanche using tar files. Wavelink recommends installing the following files at the Enterprise Server location: Enterprise Server, License Server, Statistics Server, InfoRail service, and the Tomcat WAR files.

Wavelink also recommends installing the Mobile Device Server and Service Manager together.

When you install using tar files, you must complete the following steps at each location where you are installing Avalanche:

- Creating Server Directories
- Setting User Permissions
- Installing the Enterprise Server
- Initializing the Database
- Installing the Mobile Device Server
- Installing the InfoRail Service
- Installing the License Server
- Starting the Servers

Creating Server Directories

You must create directories for the components you before can install.

To create Wavelink directories:

1. Log in as root.
2. Create the following directories:
   - `/opt/wavelink`
   - `/var/opt/wavelink`

   You will install the Enterprise Server, Mobile Device Server and InfoRail tar files to these directories.

3 Change the owner of both directories to a non-root user.

4 Log out.

5 Log in again as the non-root user.

Installing the Enterprise Server

The Enterprise Server manages mobile devices and infrastructure devices. You can install the Enterprise Server on a Linux machine, but it must be managed through the Avalanche MC Console (installed on a machine running a Windows OS).

To install the Enterprise Server

1 Create both the following directories:

- `/opt/wavelink/eserver`
- `/var/opt/wavelink/eserver`

2 Extract the eserver file to the `/var/opt/wavelink/eserver` directory.

Once you extract the Enterprise Server tar file, you must set user permissions and initialize the database before you start the Enterprise Server. For more information refer to *Setting User Permissions* on page 7 and *Initializing the Database* on page 7.

Installing the Statistics Server

Extract the Statistics Server files to the appropriate directories.

To install the Statistics Server:

1 Create both the following directories:

- `/opt/wavelink/statserver`
- `/var/opt/wavelink/statserver`

2 Extract the Statistics Server files to the `/opt/wavelink/statserver` directory.

Setting User Permissions

Before you can execute any scripts to start the Enterprise Server, Mobile Device Server or InfoRail service, you need to set permissions that allow the user to execute scripts.

To set permissions:

1 Open a terminal and navigate to `/var/opt/wavelink/eserver`

2 Set the permissions to allow the user to execute scripts by typing:

```
chmod +rwx *
```

You can now execute the scripts needed to run Avalanche MC.

Initializing the Database

If you are creating your databases in PostgreSQL, you must initialize the databases by running a script that connects to PostgreSQL and executes a series of sequel scripts. You can view the sequel scripts in the `/opt/wavelink/eserver/db` directory. This process also seeds the database with the information that the system needs to operate Avalanche MC.

NOTE If you have an Oracle 11g database, contact Customer Support for information on initializing the databases.

To initialize the enterprise server database:

1 Open a terminal and navigate to `/opt/wavelink/eserver`

2 Type `db/db_setup.sh`

3 Navigate to **System Settings > Server Settings > Services**.

4 Select **PostgreSQL** and enable the checkbox.

5 Click **Start**.

PostgreSQL creates a database for the enterprise server.

To initialize the statistics server database:

1 Open a terminal and navigate to `/opt/wavelink/statserver`

2 Type `db/db_setup.sh`

3 Navigate to **System Settings > Server Settings > Services**.

4 Select **PostgreSQL** and enable the checkbox.

5 Click **Start**.

PostgreSQL creates a database for the statistics server.

Installing the InfoRail Service

When you install the InfoRail service on Linux, you extract the tar file to the appropriate directories.

To install InfoRail:

1 Create both the following InfoRail directories:

- `/opt/wavelink/inforail`
- `/var/opt/wavelink/inforail`

2 Extract the tar file to the `/opt/wavelink/inforail` directory.

You must have user permissions set before you start the InfoRail service. For more information refer to *Setting User Permissions* on page 7.

Installing the License Server

Extract the License Server files to the appropriate directories.

To install the License Server:

1 Create both the following License Server directories:

- `/opt/wavelink/licenseserver`
- `/var/opt/wavelink/licenseserver`

2 Extract the License Server tar file to the `/opt/wavelink/inforail` directory.

Installing the Mobile Device Server

The Mobile Device Server manages your mobile devices.

To install the Mobile Device Server:

1 Create both the following Mobile Device Server directories:

- `/opt/wavelink/avalanche`
- `/var/opt/wavelink/avalanche`

2 Extract the Mobile Device Server tar file to the `/opt/wavelink/avalanche` directory.

Once you extract the tar file, you must set user permissions before you start the Mobile Device Server. For more information refer to *Setting User Permissions* on page 7.

Installing the Service Manager

The Service Manager allows you to start and stop the Mobile Device Server from the Avalanche Console. It should be installed on the same computer as the Mobile Device Server.

To install the Service Manager:

1 Create both the following directories:

- `/opt/wavelink/servicemanager`
- `var/opt/wavelink/servicemanager`

2 Extract the Service Manager tar file to the `/opt/wavelink/servicemanager` directory.

Starting the Servers

Once you extract the server files, set user permissions and set up the database, you can start the Enterprise Server, Mobile Device Server, License Server and InfoRail service.

To start the Enterprise Server:

1 Open a shell and navigate to `/var/opt/wavelink/eserver`

2 Type `./eserver_alt.sh`

To start the InfoRail service:

1 Open a shell and navigate to `/opt/wavelink/inforail`.

2 Type `./WLInfoRail`

NOTE To run as a daemon, use the `-d` option.

The InfoRail service starts running on the system.

To start the License Server:

1 Open a shell and navigate to `/opt/wavelink/licenseserver`

2 Type `./WLLicenseservice`

NOTE To run as a daemon, use the `-d` option.

To start the Statistics Server:

1 Open a shell and navigate to `/opt/wavelink/statserver`

2 Type `./statserver.sh`

To start the Mobile Device Server:

1 Open a shell and navigate to `/opt/wavelink/avalanche`

2 Type `./WLAvalanche`

NOTE To run as a daemon, use the `-d` option.

To start the Service Manager:

1 Open a shell and navigate to `/opt/wavelink/servicemanager`

2 Type `./WLAmcServiceManager`

Setting Up Tomcat

In order to use the Web Console with Avalanche MC, you must have Tomcat installed on the same box as the Enterprise Server. You must have the Enterprise Server installed before you can set up Tomcat.

NOTE If you are using Avalanche with external databases, you must contact Customer Support for assistance in setting up Tomcat.

To set up Tomcat for accessing the Web Console:

1 Obtain the WAR file from Wavelink Customer Support.

2 Ensure that the Tomcat service is not running.

3 Extract the WAR file to the `tomcat/webapps` directory.

4 Copy the following files from the `var/opt/wavelink/eserver/conf/main` directory to the `tomcat/lib` directory:

- `dao-factory.xml`
- `dao-factory-ss.xml`
- `dao-factory-ss-es.xml`

5 Restart Tomcat.

Opening the Firewall

You must allow Avalanche traffic past the firewall in order for the servers to communicate with each other. For information on what ports need to be open to allow Avalanche traffic, see the Avalanche User Guide appendix.

Increasing the Open Files Limit

If the InfoRail server is run under a user account whose per-process limit on open files is too low, the log file returns entries with errors. New subscribers will not be able to connect to the router. To raise the number of open connections or files, the per-process limit needs to be increased. The limit can be increased temporarily using the `ulimit` command before executing the router or permanently by increasing the limit for the account or the whole system.

You may also receive error messages if the overall number of open files for the entire system has been exceeded. You can check the configured limit for open files and then increase the overall number of open files for the system.

To temporarily increase:

1 Insert this command into the script that starts the router:

```
ulimit -n <new limit>
```

2 Log out of the system and then log back in for the changes to take effect.

To permanently increase:

1 Add the following lines to the `etc/security/limits.conf` file:

```
<account> soft nofile <softlimit>

<account> hard nofile <hardlimit>
```

The account field can be in various forms such as group names and wild cards.

2 Log out of the system and then log back in for the changes to take effect.

3 Modify the startup scripts for each of the dServers that need increased open file limits.

To check the configured limit:

- From a shell, enter the following command:

```
cat /proc/sys/fs/file-max
```

This command reports three values. The first value is the total allocated file openings. The second value is the total free allocated file openings. The third value is the maximum open files allowed.

To increase the file-max value

1 Navigate to `/etc/sysctl.conf` and add the following line:

```
fs.file-max = <new limit>
```

2 Reboot the system.

Chapter 2: Deploying a Mobile Device Server

If you want to run a Mobile Device Server on a Linux OS, you can create a deployment package using RPMs and deploy it to the Server Location from the Avalanche Console. This section includes the following information:

- Importing the RPM Files
- Creating a Server Location
- Building an RPM Deployment Package

NOTE You can only deploy a Mobile Device Server package. Currently, there is no support for an Infrastructure Server on a Linux OS.

After you build the deployment package, use the Task Scheduler to deploy the package. You must have the firewall configured to allow Avalanche traffic in order for the deployment to be successful.

Importing the RPM Files

Before you can build your deployment package you must import the RPM files you want to include. You need obtain the RPM files from Wavelink Sales.

To import:

1. Select **File > Import > Linux dServer RPMs**.

   The *Import Linux dServer RPMs* dialog box appears.

2. Click **Select RPMs for Import** and browse to the location of the RPMs you want to import.

3. Once you have added file you want to import, click **Import Selected RPMs**.

NOTE You can add additional RPM files by repeating steps two and three. You cannot import more than one RPM at a time.

The imported RPMs will be available when you build your deployment package.

4 Click **Done** to close the dialog box.

Creating a Server Location

You must create a Server Location on the Linux machine to which you want to deploy the RPM Mobile Device Server package. Ensure you know the root user for the user name and password.

To add a Server Location:

1 Select **File** > **New** > **Create dServer Location**.

The *New dServer Wizard* appears.

2 Type the name of the server location in the **Location Name** text box and click **Next**.

The *Enter dServer Location Site Address* dialog box appears.

3 Type the IP address of the system which contains (or will contain) a Server in the **Location Site Address** text box and select **Linux** from the **OS Platform** drop-down list. Click **Next**.

The *Enter dServer Location City Name* dialog box appears.

4 Type the name of the city where the server location resides in the **Server Location City Name** text box.

Avalanche will search its database to find all cities that have the name you specified. If you do not want Avalanche to search its database, enable the **Bypass this search** check box.

NOTE Avalanche connects to a database at the Wavelink Web site to perform this search.

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5 Click **Next**.

The *Choose Server Location* dialog box appears.

6 Select the appropriate city from the **Search Results** list and click **Next**.

The *Select Time Zone* dialog box appears.

7 Select the time zone for the city and click **Next**.

The *Enter Server Location Login Information* dialog box appears.

8 Type the **User Name** and **Password**.

9 In the **Domain** text box, enter the root user and click **Next**.

10 Click **Next**.

Avalanche attempts to contact the Server Location to verify that all the information is correct. After a few moments, the *Connection Results* dialog box appears and displays if a connection was established.

11 Click **Next**.

The *Server Location Created* dialog box appears.

12 Click **Finish**.

The Server Location appears in the region in which you created it.

Building an RPM Deployment Package

Once you have imported the RPM files and created the Server Location to which you are sending the files, you can build a deployment package.

To create a deployment package for a Mobile Device Server:

1 Click **Tools > Deployment Packages**.

The *Deployment Package Manager* dialog box appears.

2 Click **Add**.

The *New Package Wizard* appears.

3 Select the **Create a Distributed Server Package** option and click **Next**.

The Select Server Type screen appears.

4 Select the **Linux Agent RPMs** option and click **Next**.

The Enterprise Server Location screen appears.

5 Type the IP address of the Enterprise Server in the **Enterprise Server Site Address** text box. This will allow the Mobile Device Server to contact the Enterprise Server. Click **Next**.

The Select Linux Agent RPMs screen appears.

6 From the list box, select the RPM files you want to include in your deployment package and click **Next**.

The Enter Package Name screen appears.

Type a unique **Package Name** and click **Next**.

Avalanche creates the deployment package. When it is finished, the Package Complete screen appears.

7 Click **Finish** to return to the *Deployment Package Manager* dialog box.

8 Click **Close** to return to the Avalanche Console.

To deploy the Server package, you must use the Task Scheduler and perform a Deploy/Update Server task. For information on using the Task Scheduler, see the Avalanche User Guide.

Chapter 3: Managing the Mobile Device Server

Once you install and start the Mobile Device Server, you can manage the server from the Linux system on which it is installed. You may need to configure how the server contacts the Enterprise Server or serial and USB support. You also need to configure the firewall to allow Avalanche traffic.

The following information is included in this section:

- Configuring Mobile Device Server Communication
- Managing the Mobile Device Server from the Console
- Configuring Serial and USB Support

Configuring Mobile Device Server Communication

If you installed the Mobile Device Server locally rather than using the Avalanche Console to deploy a server package, you must configure the properties files before the server will function properly.

- Configuring Avalanche.properties
- Configuring servicemanager.properties

Configuring Avalanche.properties

To configure the server to connect to the Enterprise Server and License Server, configure the `Avalanche.properties` file.

To configure the dServer properties:

1. Stop Mobile Device Server.
2. In the `wavelink/avalanche` directory, open the file named `Avalanche.properties` and use a text editor to add the following properties to the file:

```
InfoRail.Server=[IP address or DNS name of the
Enterprise Server]
Licenseserver=[IP address or DNS name of the License
Server]
```

For example:
`InfoRail.Server=62.4.56.3`
`Licenseserver=62.4.56.3`

3 Save and close `Avalanche.properties`.

4 Restart the Mobile Device Server.

The server will now be able to connect to the Enterprise Server and the License Server.

Configuring servicemanager.properties

The Service Manager allows you to start and stop the Mobile Device Server from the Avalanche Console. In order for the Service Manager to function properly, the `servicemanager.properties` file must be configured.

To configure the servicemanager.properties file:

1 Stop the Service Manager.

2 Navigate to the `Avalanche.properties` file in the `wavelink/avalanche` directory and open it with a text editor.

3 Find the `SiteIdentifier` property and copy this property and its value.

NOTE You must connect the Mobile Device Server to the Enterprise Server before the `SiteIdentifier` value will be populated.

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4 Navigate to the `servicemanager.properties` file in the `wavelink/servicemanager` directory and open it with a text editor.

5 Paste the `SiteIdentifier` property and value into this file and save it.

6 Restart the Service Manager.

Managing the Mobile Device Server from the Console

Once the Mobile Device Server is installed, configured, and has contacted the Enterprise Server, it appears in the **Unassigned dServer locations** folder of the Avalanche MC Console. The dServer Location can be identified by the IP

address of the Linux host. You can then move the dServer Location to a region and rename, configure, and manage it. The Mobile Device Server will not accept connections from mobile devices until it is assigned to a region.

NOTE If the Mobile Device Server does not appear on the Avalanche MC Console, check to make sure the information in the `Avalanche.properties` file is correct.

Some older software packages may not install properly on a Linux host because of file path case sensitivity. If a package installs correctly in Avalanche MC but is not distributed to a Mobile Device Server (possibly resulting in a software installation failure alarm), retrieve the `Avalanche.log` file from the Linux host and inspect it for package installation errors. Wavelink Customer Support can help with the proper formatting of older or custom-built packages that may fail due to case-sensitive paths.

Configuring Serial and USB Support

Mobile devices can communicate with the Mobile Device Server via a serial or a USB connection. The Linux user account that is running the Mobile Device Server must be a member of the **tty** and **uucp** groups in order for USB and serial support to work.

This section provides the following information:

- Enabling Serial Support
- Enabling USB Support

Enabling Serial Support

The mobile device and the Mobile Device Server must both be configured to enable serial communication. To enable serial communication on your mobile device, refer to the specific user manual for that device. You can configure the Mobile Device Server for serial connections through the Avalanche MC Console.

To configure serial connections:

1 From the Avalanche MC Console, select the **Mobile Device Server Profile** node.

The **Mobile Device Server** tab appears.

2 Select the Mobile Device Server profile that you want to configure.

3 Click the **Device Connections** tab.

4 In the **Serial Communication Settings (RS232)** region, enable the **Reserve Serial Ports 1 and 2** checkbox to reserve those two ports for mobile device communication on the dServers.

5 Save your changes.

6 Assign the updated Mobile Device Server Profile to the correct region or deploy the updated settings to the correct region.

Serial communication is now enabled for all the Mobile Device Servers in that region.

Enabling USB Support

USB connections are only available if you have a Linux kernel 2.6.9 or newer. The manufacturers and device codes supported through the USB serial interface can be found in the source code for the ipac driver (usually `/usr/src/linux/drivers/usb/serial/ipac.c`).

USB connections are only supported on devices with a 3.50-29 (or later) version of the Wavelink Avalanche Enabler. To establish a USB connection between the mobile device and the Mobile Device Server, you must configure the Enabler for USB connections.

To configure the Enabler to communicate over a USB connection:

1 Access the **Connection** tab for the Enabler configuration.

2 Enable the **Check serial connection** and **Disable ActiveSync** check boxes.

The mobile device will now be able to connect via USB.

To connect to the Linux Mobile Device Server over a USB connection:

1 Ensure that the Enabler is configured correctly.

2 Connect the device to the Mobile Device Server system with the proper USB cable.

3 From the mobile device, force a connection to the Mobile Device Server by selecting **Connect** from the Avalanche Enabler **File** menu.

The mobile device will indicate that it has established a serial connection with the Mobile Device Server, and will download any required updates over this connection.

NOTE You cannot use the console to force an update to the client over the USB connection (i.e. via the **Update Now** Avalanche MC Console command).

Chapter 4: Using the Package Converter

The Avalanche Package Converter allows you to take older `.ava` files and convert them into a format that is compatible with Linux. The package converter is for use with old Wavelink `.ava` files and Avalanche packages created by other vendors.

Requirements

The Avalanche Package Converter requires Java JRE or JDK version 1.3.1_03 or above to run. The Java executable should be in the search path.

The Package Converter also needs some temporary disk space for its operation. The program uses the system temporary directory defined with the TMP environment variable for that purpose. If necessary, you can set the TMP variable before running the program.

Converting Packages

The Package Converter is included in the Avalanche Console Only installation. It is a .zip file located in the Avalanche MC installation directory. The default location is: `C:\Program Files\Wavelink\AvalancheMC`. The .zip file contains the following files:

- **runit.bat**. This is a Windows batch file that runs the Converter.
- **readme.txt**. This is the text file that provides information about the Package Converter.
- **PackageConverter.jar**. This is the Package Converter code.

This section provides instructions about converting packages. For the purpose of this document, the input package file refers to the original package that you are converting. The output package file refers to the converted package.

To convert a package:

1. Locate the `PackageConvert.zip` file in the Avalanche MC installation directory.
2. Unzip the file into a directory of your choice.

3 Place all `.ava` packages that you are going to convert in this same directory.

4 Open a command prompt.

5 Navigate to the location of the Package Converter.

6 Use the following format to convert packages:

```
runit <options> <Input Package> <Output Package>
```

7 Press **Enter**.

The package is converted and placed in the same directory.

The following is a list of options you can use to manipulate the Package Converter:

-k	Builds a synthetic CTT file from the PPF.
-h	Displays the help page.
-m	An optional version 3 main executable.
-n	Forces the Package Converter to run strictly as a version 2 package to version 3 package converter.
-r “<new package name>”	Allows you to rename the output package.
-s “<vendor name>”	Changes the vendor name from Wavelink Corporation to a specified name.
-v	Runs the Package Converter in verbose mode.